An analysis of the differences and commonalities between climate sceptic and climate optimist discourse as found in YouTube videos

Master Thesis Positive Clinical Psychology
Jana Westermann (s208557)
University of Twente
Faculty of Behavioural, Management and Social Sciences
First Supervisor: Dr. Heidi Toivonen
Second Supervisor: Dr. Tessa Dekkers
20.03.2023

Abstract

Climate optimism is a discourse that constructs climate change as a serious issue that is solvable by humanity, while climate sceptic discourse constructs a world in which climate change is a negligible issue.

Filling research gaps such as climate change discourse in YouTube videos and comparative discourse analysis on climate change, this study looks at the similarities and differences between climate optimist and climate sceptic discourse.

It finds both similarities and differences in how they construct their worlds, and makes recommendations for future studies and climate change communications based on the results.

Alles wird gut	*Everything will be alright*
Die Menschen sind schlecht	*Humanity is bad*
und die Welt ist am Arsch	*and the world is fucked*
Aber alles wird gut	*But everything will be alright*
Das System ist defekt,	*The system is broken*
die Gesellschaft versagt	*society is failing*
Aber alles wird gut	*But everything will be alright*
Dein Leben liegt in Scherben	*Your life is in pieces*
und das Haus steht in Flammen	*and the house is on fire*
Aber alles wird gut	*But everything will be alright*
Fühlt sich nicht danach an	*Doesn't feel like it*
Aber alles wird gut	*But everything will be alright*

– Der Letzte Song (Alles wird Gut)
Kummer, 2021
(translation by the author)

Thank you to Heidi, for her patience and guidance.
Thank you to Tessa for providing additional perspectives and advice.
Thank you to my mother, for everything.

Introduction

Despite the fact that 97% of published literature on the topic of climate change agrees on the fact that climate change is a real, man-made issue (Cook et al., 2013), public debate on the topic lacks any such agreement. Fleming et al. (2014) note that a number of social groups each create their own discourse and construct their own version of climate change, listing, among others, the media, scientists and politicians. Narrowing it down, Bliuc et al. (2015) state that climate change discussion can best be understood as a conflict between two separate groups – the climate change "believers" and the sceptics. Etkin and Ho (2007) point out the "opposing positions" of sceptics and those concerned about climate change. A similar division can be found in Tyagi et al. (2020), who investigated polarisation between groups of climate change "believers" and "disbelievers". Both groups have been found to act in direct opposition to each other, discussing and attacking one another across various social media platforms (Barr, 2011; Brüggemann et al., 2020; Tyagi et al., 2020). As this is a discourse analytical thesis, I am not concerned with debates between groups, but rather the discourses created as part of these debates. However, it is important to acknowledge that each discourse is created not in a vacuum, but as a way of interacting with the other group, as well as other discourses and groups throughout society. Though the debate is commonly framed under the terms of "believers" and "non-believers", I will be describing the discourses using the terms "climate activists/activism" and "climate sceptics/scepticism" going forward, acknowledging that climate change and anthropogenic global warming are proven scientific facts, not matters of belief. I will be using the term "climate optimism" to describe discourse in which climate change is constructed as a real, man-made issue that is however possible to resolve or mitigate, while "climate pessimism" refers to discourse in which climate change is constructed to be a serious, man-made phenomenon that should be resolved, though with great difficulty, but which is steadily worsening with no hope of clear improvement.

The sceptics represent a climate change discourse characterised by misinformation (Treen et al., 2020), which is spread both knowingly and unknowingly across social media platforms, such as Facebook, Twitter, Reddit (Treen et al., 2022), and YouTube (Allgaier, 2019). The discourse of climate scepticism is centred around discrediting the scientific facts of climate change. This is done in two different ways: One popular discourse of climate sceptics uses terms such as "hoax" to describe the phenomenon of global warming, denying the existence of scientific evidence entirely (Barr, 2011; van Eck & Feindt, 2021). This discourse also puts the

blame on politicians, who are accused of using the "lie" of climate change in order to control the population by forcing green energy and increasing taxation (Jaques & Knox, 2016). The other common discourse is to minimise the threat of climate change. While acknowledging that global warming happens in some form, this discourse argues that climate change is not dangerous and not caused by humanity, again alleging that scientists and politicians exaggerate the threat to further their agenda (Brüggemann et al., 2020; Etkin & Ho, 2007). For this paper, I will be using the term "climate sceptics" to describe the discourse that discredits scientific findings to argue that climate change is not a threat to humanity.

The discourses of climate activism (defined by Tyagi et al. (2020) simply as "those who cognitively accept anthropogenic causes of climate change") can be divided into two main strands – pessimism and optimism. Randall (2009) talks about the "parallel narratives" of climate change activism. The first of these narratives is centred on the problem of climate change itself, focusing almost exclusively on loss, such as loss of lives, comfort, wealth or resources. On the other hand, there is the narrative of possible solutions, which largely ignores these losses. Cattell (2021) found the same distinction among youth climate activists, who were internally divided by whether they constructed climate change as something that would lead to the downfall of society or as a serious threat to humanity that could still be mitigated. This distinction between optimistic and pessimistic climate change appears in many other articles. There is climate change belief discourse which focuses on discussing solutions and hopeful messages (e.g. Costello et al., 2011; Mann et al., 2017), as well as opposite discourse focused on warning that climate change is a serious threat, emphasising the ways in which it negatively impacts the world (e.g. Beattie, 2017; Miller, 2019). These two different discourses are also in interaction with each other. Beattie (2017) constructs optimism as a threat to the climate activist movement, asking whether Donald Trump's climate change denialism might be due to optimism bias and warning that "over-optimism could potentially be very damaging", while Miller (2019) describes climate optimism as "as a misguided confidence in the accommodation of the [...] climate to human needs [...]".

Examples of optimistic discourse, as found in both scientific papers and newspaper articles, depict people subscribing to pessimist discourse as overly negative naysayers preventing progress: in an article for the Washington Post, Mann et al. (2017) argue that "doomsday scenarios" are just as harmful as active climate change denial, while a 2011 paper by Costello et

al. draws the same parallel as they warn that “Action must not be delayed by contrarians, nor by catastrophic fatalists who say it is all too late”.

Existing research on climate change beliefs and communications also does not agree on whether optimism or pessimism are the more effective perspective. Mayer and Smith (2018) found the belief that it is impossible to solve climate change reduces the rate of behavioural change and willingness to participate in solving the problem. They state that politicians and media must carefully frame climate change as a serious, but solvable issue in order to maximise risk perception and willingness to change. Morris et al. (2020), however, found that pessimistic messaging about climate change actually increases risk perception and outcome efficacy (the belief that a person can have an impact on climate change) due to heightened emotional arousal compared to optimistic messaging.

As my analysis is focused on climate change discourse specifically as it occurs on social media platforms, I looked for existing research specifically in that field. While there are papers analysing climate change discussion on specific social media platforms, there is a lack of literature discussing specifically climate change discourse on YouTube, despite the platform having a proven political impact (Ricke, 2014). Existing papers analysing YouTube tend to be about the quantity of videos (Allgaier, 2019) or focus on the comment section below videos, rather than the content of the videos itself (Uldam & Askanius, 2013).

I also looked at existing research on climate discourse in other contexts outside of social media. In addition to the discourse analytical papers discussed above (Borr, 2011; Brüggemann, 2020; van Eck & Feindt, 2021; Jaques & Knox, 2016; Etkin & Ho, 2007), further analyses on climate change discourse include Molek-Kozakowska (2018), who analysed articles on the topic with an express focus on the things that did not get mentioned. She found that discourse was centred around a western, first world point of view and that it framed climate science as a novel, modern field, wherein climate change is an opportunity to develop new technologies and enable progress. The details of how this science is accomplished are pushed to the background, as are any considerations of adapting to the changes brought on by global warming and the question of who should be held accountable. Texts instead tend to “blame climate change” for adverse consequences, removing human accountability. Etkins and Ho (2007) also list a number of factors they found to be missing from public discourse, mainly the larger context of climate change. Discourse focuses on direct issues such as reducing CO2 output, instead of, as they put

it, the “wider question of how to live sustainably within a world that demonstrably and inevitably is finite in terms of the resources it offers”. They also found that existing discourse is firmly seated in the realm of “fantasies”, viewing the problem in relation to intellectual frameworks and the population’s fears or anxieties. Toivonen (2022) focused on how climate change agency (the ability and capacity to act in regards to the climate crisis) is discursively constructed, and found the most common types of agency to be collective, individual, critical, and threatened. Of those four, the collective and critical agencies are the most relevant to my analysis, with critical agency paralleling the views of climate sceptics while collective agency is similar to my definition of climate optimist discourse. Collective agency is characterised by the use of “we” and “us” pronouns and constructs people as being able to combat climate change by working together. The critical agency type constructs themselves as having the responsibility to debunk climate change beliefs, as everyone but them misunderstands the phenomenon.

For this thesis, I am interested in the potential parallels between climate scepticism and climate optimism. As noted by some of the criticisms of climate optimism cited above, it can be argued that both discourses aim to minimise the threat posed by climate change. In order to complement the research gaps noted above, I am not only focusing specifically on climate optimism discourse, but also analysing the content of YouTube videos, neither of which has been done before. This is also the first comparative analysis of two climate change discourses. Therefore, the research question of this paper is “What commonalities and differences can be found between climate optimistic and climate sceptic discourse, as found in YouTube videos?”.

Methods and Materials

Finding and selecting videos

I searched for YouTube videos using my browser's incognito mode in order to avoid YouTube using the data from my personal account and browsing history in order to tailor the results to my interests. I then conducted multiple searches, combining the main search term of "climate change" with other terms such as "hoax", "hysteria", "lies", "alarmism" in order to find videos using climate sceptical discourse. I chose to use these terms based on my previous definition of climate scepticism. To find videos for the climate optimist side, I instead added search terms such as "optimism", "fixing" and "hope", again in line with my earlier definition.

For both discourses, I was looking for YouTube videos that were original content, so no compilations or re-uploads from other sources, such as podcasts. I was also looking for videos with a sizable audience, excluding channels with subscriber counts lower than 100.000 and views lower than 250.000 in order to exclude videos made by lesser known or inactive channels. While these can also provide worthwhile analysis results, I wanted to ensure that the discourses I analysed had reached a sizable audience. This would make any recommendations for climate communication I made based on my results more likely to apply to a large number of people. Additionally, I restricted my selection to videos from the last 3 years, so no earlier than 2019, in order to have both videos be relatively up to date and addressing current political and scientific circumstances. Finally, I aimed for the two final videos to not have been released more than a year apart, to ensure any differences in discourse could not be attributed to different knowledge of scientific advancements, climate statistics, etc.

Taking into account these criteria, I skimmed through videos to see whether they had an overarching structure and seemed scripted, so as not to compare a planned out video to one that might be a more spontaneous, stream of consciousness one. I then made sure their arguments fit my earlier definitions for climate optimism, in which climate change is a real, man-made phenomenon possible of being resolved or mitigated, and scepticism, which is discourse that discredits scientific findings to construct that climate change as ultimately harmless to humanity, respectively. In the end, I settled on two videos, one video each to be the basis of my analysis on climate sceptic and the climate optimistic discourse.

Materials

The two videos used for this analysis were each retrieved from YouTube.com, and transcribed using Amberscript.com's mechanical transcription services. Next, I looked over and corrected the transcripts, filling in the gaps of words the transcription tool had misunderstood, misplaced punctuation and so on. The full transcripts can be found in the appendices of this paper.

The climate optimist video, "*We WILL fix climate change!*", was uploaded to YouTube 05.04.2022 via the YouTube channel "*Kurzgesagt - In a Nutshell*". The video is 16 minutes and 11 seconds long, and has, as of November 2022, 9.4 million views. The video ends with a sponsored ad read, which was excluded from the analysis, leaving me with a video length of 14 minutes and 7 seconds. The channel behind the video, *Kurzgesagt,* has over 19 million subscribers (Kurzgesagt, 2022). On their website they describe themselves as "a Munich-based YouTube channel and animation studio with a unique perspective on design, colour, and storytelling", with a team of "researchers, writers, designers, animators and producers" behind each video (Kurzgesagt, n.d.).

The climate change sceptic video, *"Is There Really a Climate Emergency*?", was uploaded to YouTube by the channel PragerU on 25.10.2021. This video is 5 minutes and 32 seconds long, with an outro advertising the channel which was again left out, resulting in a length of 5 minutes and 17 seconds for analysis. As of November 2022, the video has over 870.000 views, while the PragerU channel itself has just under 3 million subscribers (PragerU, 2021).

On the "About" tab of their YouTube channel, PragerU describe themselves as an "educational media platform dedicated to promoting pro-American values", offering a "free alternative to the dominant left-wing ideology in culture, media, and education". The video features Steven Kooning as presenter. In the video, he introduces himself as "former Undersecretary for science in the Obama Administration and author of 'Unsettled - What climate science tells us, what it doesn't and why it matters'". He holds a PhD in theoretical physics (NYU Stern, n.d.).

Discourse Analysis

Discourse analysis is a qualitative research method that views discourse as the very basis of all human action (Potter, 2012). Therefore it is possible to analyse exchanges on a language level to see how the participants use language to construct and understand the world around them. This can be applied not only to conversations between two people, but also to one-sided interactions, such as speeches or, in this case, YouTube videos. Using discourse analysis will allow me to look at and compare how the world is constructed in each video, and how they make sense of climate change.

I chose this specific method because it looks at the way language constructs the world. Therefore it provides a bigger picture than a method such as rhetorical analysis, which focuses on single words, while being more focused on details than a narrative analysis, which focuses on overarching stories and their structure. Finally, I also chose discourse analysis because it is in line with how many other papers, as cited in the introduction, analyse the topic.

My analysis process is guided by the eight stages of psychological discourse analysis as described by Goodman (2017). While stages 1 - 4 concern creating a research question, finding, deciding on and transcribing the materials, the analysis begins from stage 5: "Preliminary reading of the data - Searching for the action orientation" and continues on in stage 6: "Generating results - Discursive devices and Rhetorical/Interactional strategies", and finally culminates in stage 7, "Building a case to support the findings". I will be referring back to these stages and elaborating on them as I go on.

Analysis

Following stage 5 of Goodman's (2017) approach, my initial analysis of the transcripts of "*We WILL fix climate change!*" and *"Is There Really a Climate Emergency*?" consisted of an iterative process of reading and rereading. The first time reading, I highlighted things that stood out to me as appearing often or being discussed in greater detail. As Goodman puts it, this stage is about looking for "what is being accomplished in the data"– therefore I took special note of topics that were being presented to the audience in a way that constructed a specific view on said topic. For example, the statement "Today we can say with confidence that coal is dying" from Kurzgesagt's video is one that accomplishes the construction of a world in which fossil fuels are becoming a thing of the past. This would therefore be noted down as a construct regarding coal. Once I had

collected examples across both texts, I grouped them together into topics where appropriate. Therefore, the above Kurzgesagt quote is listed under the topic “fossil fuel industry” with other quotes regarding coal, oil, or the industry as a whole. Finally, I looked for which of these topics were discussed in both videos and could therefore be analysed and compared. The final list of topics were “Climate Change”, “People” or “Humanity”, “Science” or “Scientists”, “Politics” or “Politicians”, “the Fossil-Fuel Industry” and “CO2”.

Following this, I moved on to stage 6, looking at which discursive devices and rhetorical strategies were used by the two videos to construct their respective discourses. These are shown in greater detail below, following the advice from stage 7, which is to select examples for the strategies used and describe them in detail, as well as what they are accomplishing, or attempting to accomplish.

Results

My analysis showed that the main topics for which constructs were present in both videos were “Climate Change”, “People” or “Humanity”, “Science” or “Scientists”, “Politics” or “Politicians”, “the Fossil-Fuel Industry” and finally “CO2”.

Table 1 below lists these topics, as well as a short description of how each construct mainly appears in the discourse of the respective videos. In most cases, each video constructed one specific view of each topic, with only a few instances of constructs on the same topic contradicting each other. In this case, the more common construct was provided in the overview so as not to overcomplicate the table. Below I will go into greater detail on each construct and provide examples from the texts, as well as note possible occasions of there being several constructs within one video.

Table 1
Constructs as they appear in both videos

Topics	Constructs	
	"We *will* fix climate change!"	**"Is there really a climate emergency?"**
Climate Change	A real problem and threat, but over dramatised via tragic and sad "stories"	A "belief" many people hold that is somewhat true, but with caveats
People/Humanity	A resilient group of people who will endure the effects of climate change and are capable of changing and adapting to new circumstances	An arrogant group of people who are naive and incapable of reading and understanding scientific findings on their own, but just accept what is told to them by the media
Science/Scientists	An objective, neutral group of people who state that climate change is a serious threat, while working on technological advancements that can help achieve a better future	Misunderstood by the general public, while themselves not knowing the limits of their knowledge, attempting to predict factors they cannot predict based on subjective assumptions
Politics/Politicians	Inactive group of people who seem "committed to not doing anything meaningful", but are slowly beginning to see the threat of climate change	Attribute all natural catastrophes to climate change, virtually identical in their opinions and messaging to the media
The Fossil-Fuel Industry	The main antagonist in an "us vs. them", one big powerful entity who will do everything to prevent humanity from stopping climate change	A neutral producer of most energy, targeted by "alarmists", but impossible to replace due to their importance
CO2	No longer a substantial problem, a lot of technological advancement, possible to remove from atmosphere	A long-term problem, stays in the atmosphere for decades and is impossible to reduce or remove, pointless to attempt reduction

Climate Change

In Kurzgesagt's video, climate change is constructed as a story people are told: "Some of the most widely shared stories about climate change are that it is an existential threat"; "You probably know this story. The last decade has been an immense failure for climate policies [...]". They emphasise that the story being told is a tragedy, stating that climate change is "scary" and "tragic": "It's an age of doom and hopelessness, and giving up seems the only sensible thing to do."; "If current climate policies stagnate, we're likely to end up with warming of around three degrees Celsius by 2100, which is scary and tragic and far from acceptable.".
However, they are quick to clarify that this is not "the whole picture". Kurzgesagt never specify who tells most of these stories. While the narrative of extreme hopelessness is attributed to the fossil-fuel industry, the other stories about climate change are attributed to a collective consciousness wherein everybody just knows about the threat of climate change and policy history. By talking about climate change as this story everyone "probably" knows and has heard, but that does not have a clear origin or narrator, Kurzgesagt create an image of it as almost a fairy tale, something that is used in the video going forward to support their construction of the fossil fuel industry as a great villain and the audience as a united force fighting for good, which I elaborate on below.

The PragerU video, on the other hand, talks about climate change as a "belief" many people hold: "Here's what many people believe: one, the planet is warming catastrophically because of certain human behaviours ". PragerU allows that this belief holds some truth – "Yes, it is true that the globe is warming, and that humans are exerting a warming influence on it, but [...]"; "Yes, there are human influences, but [...]", but always follows this admission up with a qualifying statement: "Yes, it's true that the globe is warming and that humans are exerting a warming influence upon it, but beyond that, to paraphrase a line from the classic movie, the Princess Bride, I do not think the science says what you think it says"; "Yes, there are human influences, but the climate is complex". The truth about climate change, according to PragerU, can actually be "reassuring".

There are clear parallels between the two videos here – both talk about climate change as something that the public is not given all the information about, while both "beliefs" and "stories" suggest something decidedly unscientific and emotionally based. The biggest difference between the two, however, is in the way their respective truths of climate change are presented:

For Kurzgesagt, the truth does not directly contradict these stories, which are acknowledged as something bad and threatening, as well as something that is *also* true. PragerU, on the other hand, sees the "belief" of climate change as something that is only partially true, and never fully understood by most people. This climate change belief is constructed as something that needs to be challenged and corrected by those who are able to understand it fully, which is in line with the "critical" agency discourse found in Toivonen (2022). If Kurzgesagt's climate change is constructed in the terms of stories, PragerU constructs climate change as an ineffable higher being that, for most people, can only be believed in, not understood.

People/Humanity

Kurzgesagt constructs an image of humanity as something that is resilient and adaptable: "Civilisation might have to change, but it will endure". They also talk about themselves as part of this society, using the pronoun "we" to talk about the steps humanity has taken towards mitigating climate change, such as "We're rapidly replacing old incandescent light bulbs with [more efficient ones]". They acknowledge that there still room for improvement, and humanity is not yet doing quite enough, but attribute them with a strong potential to improve: "[...] just think about what humanity can do when climate change finally gets the political attention and funding it needs". Kurzgesagt depict both themselves and the audience as equal parts of the humanity construct. They do this by using "we" and "us" pronouns when talking about combating climate change. Examples for this include statements such as "Now it's our job yet again to prove the predictions wrong", "If we want the world to change we first need to believe that change is possible". They also create this sense of community when discussing the severity of the situation: "Our home is burning" is the opening sentence of the video, and they finish the introductory part by saying "Okay, let's start with the scariest things".

In the world constructed by PragerU, on the other hand, humanity is described as a group of naive, arrogant people unwilling to and incapable of doing their own research and understanding scientific findings. Saying "Hubris fairly describes our current response to the issue of climate change", PragerU's video argues that it is arrogant of humanity to assume they could have any meaningful impact on the climate, both positively and negatively. They repeatedly state that "the science" goes over the heads of the general public: "I do not think the science says what you think it says" and "Nor does the public understand the questionable basis

of all catastrophic climate change projections". The narrator takes care to exclude himself from this construct. When he uses "we" it is to talk about himself and other scientists: "But to create a climate model we have to make assumptions", "In fact, the more we learn about the climate system, the more we realise how complex it is". Other uses of "we" and "us" exist in the text, but are referring to humanity as a whole, without including the narrator or the audience directly.

On this topic, the differences between the two videos are strong – Kurzgesagt's version of humanity is a well-meaning, strong, adaptable people who can and will do their best to combat climate change. PragerU, on the other hand, construct a humankind with no agency or opinions of their own, who just accept the (false) information fed to them by the media, and who would be struggling to understand the actual facts regardless. It is also noteworthy that Kurzgesagt include themselves in this construct, while PragerU do not.

Science/Scientists

In the world Kurzgesagt describe in their video, scientists are a neutral party who provide objective facts on the situation and work on technological advancements to help humanity in the fight against climate change. "Wherever you look, you find scientists, engineers and entrepreneurs trying to solve some aspect of climate change" creates an image of scientists as a force working tirelessly for the good of the world, using their "enormous amounts of human ingenuity". Meanwhile "What does science actually say?" is the opening to a paragraph about facts and numbers regarding climate change, presented as the absolute objective truth.

To PragerU, science is something far removed from the life of the average human – "Very few people, and that includes journalists that report on climate news, read the actual science". Beyond that, the video begins to build up two conflicting versions of science: on the one hand, there are the reliable, correct scientific facts that tell us that climate change is nowhere near as serious as people believe, "[...] what the data, the hard science, from the US government and the UN climate reports say, is that thing's aren't that bad", and then goes on to depict scientists as untrustworthy people who attempt to predict things they cannot possibly predict: "How can we possibly know [...]? Obviously, we can't"; "That's a pretty shaky foundation on which to transform the world's economy".

However, PragerU's video also has the narrator characterise himself as an experienced scientist – "I should know. I wrote one of the first textbooks on computer modelling". When he uses "we" it

is to talk about himself and other scientists, not to include the audience in his statement: “But to create a climate model we have to make assumptions”, “In fact, the more we learn about the climate system, the more we realise how complex it is”.

Again, there are clear differences between the two videos on this topic. Kurzgesagt depict scientists as infallible forces for good. PragerU’s video has contradictory constructs on the topic. On the one hand, they say that science can only be understood by the very intelligent. They include the narrator as an experienced scientist whose understanding of the situation is far superior to the audience’s. This construct of science depicts the field as being complicated to understand and having a correct estimation of how severe climate change is. They then contradict themselves by constructing scientists as a group of people who are making unreliable predictions that exceed their capabilities.

Politics/Politicians

In Kurzgesagt’s video, politicians are initially described as a group of people who are seemingly “committed to not doing anything meaningful” regarding climate change, but who, after a decade where “instead of passing comprehensive, binding bills that would meaningfully reduce emissions” they “mostly did nothing”, are now acknowledging the severity of the issue, and at least setting goals to reduce emissions to a net zero. For PragerU, politicians are depicted as virtually identical to other unreliable sources: “Rather than admit [the complexity of the climate], the media, the politicians, and a good portion of the climate science community attribute [every major weather event] to climate change”.

Both videos similarly depict politicians as a rather passive group of people. The major difference between the ways they construct this topic is that, while for Kurzgesagt this lack of action is due to underestimating the threat of climate change, to PragerU the inaction stems from politicians being overly scared.

Fossil Fuel Industry

For Kurzgesagt, the fossil fuel industry is a powerful entity whose main goal is to prevent humanity from stopping climate change: “The sadness and hopelessness that many people feel is real and very destructive because it causes apathy. Apathy that is only serving the fossil fuel industry, that is still delaying change however it can. In a sense, they have weaponised

hopelessness". Kurzgesagt describe the situation in terms of warfare: hopelessness has been turned into a destructive weapon, all with the aim of preventing change for the better. And it is an antagonist that needs to be fought: the concluding words of the video are "Don't let them win". They make sure to emphasise that this fight can be won throughout the video: "Today we can say with confidence coal is dying", again putting the conflict into an aggressive context with the use of the word "dying". This depiction of the fossil fuel industry as a force of pure evil ties in with their construction of climate change as a story, as mentioned earlier – the clear villain of this story is the fossil fuel industry.

For PragerU, on the other hand, the fossil fuel industry is a wholly neutral entity – the "alarmists" are saying that, to combat climate change, "we get rid of fossil fuels". However, fossil fuels are depicted as vitally important to humanity – to PragerU, getting rid of fossil fuels is not only impractical, "it's not scientifically possible". The use of the word impractical before talking about scientific possibilities emphasises how fossil fuels are a quintessential part of everyday life. Here, the fossil fuel industry is a neutral entity that provides an essential service: "We get over 80% of the world's energy from fossil fuels".

The world views constructed by the two videos on this topic are fundamentally different – to Kurzgesagt, the fossil fuel industry is a big evil that should and can be defeated, while to PragerU, it is an integral part of all our lives, and taking it away is unthinkable. However, they both depict the fossil fuel industry as a faceless whole, with no or little mention of the people that make up this entity, and what their motivations might be.

CO2

Kurzgesagt talk about CO2 as something that is generally assumed to be tied directly to the economy: "The best news is that emissions are no longer necessarily coupled with economic growth. In the past, this was an inconvenient truth: to get richer you had to emit more." While CO2 is something that should and can be reduced, they place great importance on doing so without negatively impacting economic growth: "It's no longer a matter of having to choose between prosperity and the climate". They remain optimistic, however, citing the many ways technological and scientific advances have made it possible to reduce emissions and even remove CO2 from the atmosphere. This is again framed in terms of economical concerns: "We are at the point where not decarbonising is a bad business decision".

In PragerU's video, CO2 is an inevitability. Directly tied to the irreplaceable fossil fuel industry, CO2 cannot be fought: "CO2 doesn't disappear from the atmosphere in a few days, like, say, smog. It hangs around for a really long time"; "In other words, it takes centuries for the excess carbon dioxide to vanish from the atmosphere". According to PragerU, there are no solutions to this issue, and there is no point in even attempting to fix it: "Any partial reduction in carbon dioxide emissions would only slow the increase in human influences, not prevent it, let alone reverse it. CO2 is not a knob we can just turn down to fix everything. We don't have that ability." While PragerU do acknowledge that there are negative consequences to emitting CO2, using the term "fix" and even refer to "human influences" that could ideally be "reversed", they make it very clear that there is no use in trying to combat this issue. They finish the video's section on CO2 by stating that to attempt this would be "hubris" on humanity's part. Though humanity emitted the CO2 into the atmosphere in the first place, they are adamant that it is now an insurmountable problem beyond human capacity to solve.

The differences between the two videos on this topic are clear – Kurzgesagt are certain that humanity can solve the issue of CO2 emissions, while PragerU insist that there is no point in even trying. Both videos however are clear on the fact that CO2 is coupled with the important issue of economic growth, Kurzgesagt by stating so directly, and PragerU by emphasising the relationship between CO2 and the fossil fuel industry.

Discussion

During my analysis, I found a total of six constructs which appeared in both videos. The construct "Climate Change" is depicted as a serious and real threat in Kurzgesagt's video, and as a "belief" that is only partially accurate in PragerU's. "People" or "Humanity" are constructed as a resilient and adaptable group by Kurzgesagt, and as arrogant and naive by PragerU. PragerU have two contradictory ways of constructing "Science" or "Scientists": they are both intellectually far ahead of the general public, and correctly estimate the severity of climate change to be low, and also arrogant to believe they can make accurate predictions of the climate. Kurzgesagt's version of this construct depicts scientists as an objective and neutral group whose technological advancements are helping humanity combat climate change. For the "Politics" or "Politicians" construct, Kurzgesagt depict politicians as inactive but slowly realising that climate change is a real threat, while PragerU depicts them as overestimating the threat of climate

change. In Kurzgesagt's video, "The Fossil-Fuel Industry" as a construct is the main antagonist trying to stop climate change activism, while they are a vital energy producer with no possible replacement to PragerU. Finally, the construct "CO2" is something that cannot be combated or removed to PragerU, while it is a problem that is easily solved to Kurzgesagt.

The answer to my research question "What commonalities and differences can be found between climate optimistic and climate sceptic discourse, as found in YouTube videos?" is therefore that there are in fact both commonalities and differences in the constructed realities of the two videos. Both depict politicians as largely without agency, and clueless about the actual severity of climate change, though they have different ideas about what that actual severity is. Both also construct climate change as something that people have a sort of fictionalised half knowledge about, be it in the form of "stories" or "beliefs". Interestingly, they also both agree on the fact that climate change exists in some form, contrary to the popular depiction of climate change sceptics as completely discarding the concept. They do, however, have vastly different views on the other core topics: They disagree on whether scientists are a competent source of facts or a group of people exceeding their skills to make impossible predictions. They also construct the role of the fossil fuel industry very differently – innocent bystanders providing the world with vital energy in climate sceptic discourse, the main villain trying to maintain the status quo in climate optimist discourse. They do however both describe the fossil fuel industry as a faceless whole, not mentioning the people who make up this entity. While the two discourses remain vastly different in how they treat scientific fact, it should not be discounted that there are also some parallels.

A lot of the constructs I found in the two videos are in line with existing literature on how climate change is talked about – the climate optimist video is in fact focused on solutions far more than problems, which is something Randall (2009) found in his analysis of climate change narratives. Kurzgesagt also argues for change in a manner very similar to the collective agency construct used by individuals according to Toivonen (2022). This collective agency was characterised by a frequent use of "we" and "us" pronouns and depicted humanity as able to solve climate change by working together. These parallels show that my results are not specific to the discourse found in YouTube videos on climate change, and similar ways of talking about climate change can be found in a variety of contexts. PragerU mostly follows the climate sceptic discourse described earlier (Etkin & Ho, 2007; Brüggemann et al., 2020), discrediting scientific

facts in order to minimise the threat of climate change. A notable divergence here is that, in opposition to common climate sceptic discourse (Barr, 2011; van Eck & Feindt, 2021) PragerU does not depict climate change entirely as a hoax, instead acknowledging that it is a real phenomenon. They also do not accuse the government of furthering this "lie" in order to increase their power over their citizens in opposition to what Jaques and Knox (2016) describe.

Another interesting aspect of these findings becomes apparent when looking at what both videos do not talk about. This topic has previously been discussed by Molek-Kozakowska (2018) and Etkin and Ho (2007). Both studies found that climate change discourse tends to gloss over a number of topics, a lot of which I also found in my analysis. Molek-Kozakowska found a lack of discussion of how exactly scientific advancements in regards to climate change come about, and similarly the climate optimist video in my analysis also focused on praising technological advancements, without looking at the whys and hows behind it. Both discourses, except for one throwaway mention of lobbyism in the Kurzgesagt video, do not include any mention that politicians may be invested in fossil fuel themselves, or that scientists might be funded by large corporations – scientists specifically in both videos are described as one homogenous entity with no accounting for scientists with ulterior motivations. The same is true for how both videos talk about the fossil fuel industry, as one entity with no human factor or individual people behind it. This may serve to simplify the world's they construct for their audiences, which are noticeably made up of black and white absolutes for both videos. These black and white absolutes can be seen in the way neither video allows for grey areas: things are always constructed as being entirely good or entirely bad.

Both videos attribute some ability to create change to politicians – who both agree are not using it efficiently, if at all – and to "humanity" as private individuals working together. There is no talk about the capacity to change things for large corporations and the people who own them, and no attributing responsibility for climate change to those corporations, and the drive for economic growth created by capitalist societies as a whole. This is in agreement with Molek-Kozakowska (2018), who found that climate change discourse within popular science journalism shying away from framing things in terms of responsibility and agency, often choosing to blame climate change as a whole, instead of humans or governments. Etkin and Ho (2007) argued that public climate change discourse is often focused on solving specific problems, instead of the "wider question of how to live sustainably within a world that

demonstrably and inevitably is finite in terms of the resources it offers". This is also reflected in my results, where the focus is on specifics such as CO2 reduction or replacing fossil fuel energy, with no consideration for the bigger picture of how humanity might have to change in the future. It becomes especially apparent in the way Kurzgesagt construct CO2: they depict it as a problem that is as good as solved, and therefore there is no need for humanity to choose between solving climate change and advancing economically. Molek-Kozakowska (2018) also mentioned a lack of climate change discourse regarding humanity's need to adapt to climate change – this can be found specifically in my analysis on Kurzgesagt's CO2 construction, in which they emphasise how important it is that it is possible to reduce CO2 emissions without having to accept economic drawbacks.

The results of this paper provide important insights into two common climate discourses by showing what constructs are important for both optimist and sceptic discourse. Any additional understanding of the way these two world views are constructed can be helpful when it comes to combating climate anxiety and misinformation on climate change. By highlighting the fundamental differences between the two discourses, it should be possible to combat the accusations climate optimists receive of being no better than climate sceptics. By making it more known that climate optimists do not simply minimise the issue, as they have been accused of, climate optimists should be able to increase their platform within the climate movement thus allowing the messaging of the climate movement to take a more positive perspective where appropriate, and helping to reduce climate anxiety in the general public.

In addition to this being a discourse analytical paper, I am also writing from a positive psychological perspective, a field which focuses on an individual's positives and strengths in order to increase resilience and wellbeing (Gable & Haidt, 2005). Positive psychology aims to oppose the focus clinical psychology puts on pathology and illness by instead highlighting what is good and healthy about a person's mental health (Seligman, 2002). From a positive psychological perspective, promoting more optimistic viewpoints on the climate crisis should increase the resilience and wellbeing of the people trying to combat climate change.

This paper fills several gaps in existing literature, both by being focused on YouTube videos, as well as by being a comparative analysis between two climate change discourses. It is also one of very few papers focusing on climate optimism. Another strength is that, by analysing two videos, I was able to do a more detailed and in depth analysis.

This paper's analysis was limited mainly by its scope – due to it being a 10 EC master's thesis, I only analysed two videos, and only did a general discourse analysis, without going into great depth on less common or smaller constructs. It is also important to note that this analysis was done by just me, and both my professional background as Master's student in clinical psychology and my personal background as someone who cares about fighting climate change in an optimistic manner will likely have influenced my analysis in some way. Additionally, the study is limited by the fact that the videos analysed were US-American and German, respectively, and analysed by a German. This creates a very limited perspective on the topic, and future studies should try to incorporate viewpoints from across the globe, especially focusing on people who are not white and living in first-world countries. The same issue of climate change discourse focusing exclusively on Western society was also highlighted by Molek-Kozakowska (2018), further emphasising the need for more diverse perspectives in research.

Aside from conducting research using more than two videos, there would also be benefits in adding the position of climate activist discourse with a less optimistic outlook, and seeing how this fits into the parallels and differences found between the initial two discourses. Additionally, going into further detail of climate sceptic discourses could be of interest – while the common definition of climate sceptics is a complete denial of climate change as a whole, my results show that there is very much climate sceptical discourse that does depict climate change as being entirely fictitious. It might also be valuable to see how different online platforms compare to each other in the climate discourse they construct. This could open up a lot of new research questions, from the demographics of the user bases, to how the functionality of platforms allow for different discourses to form and interact with each other. Additionally, a more in depth analysis of either position, as well as the missing themes, might yield further valuable insights into the issues and topics excluded from discourses.

Based on my findings, it might be possible to reach out to climate sceptics by highlighting the similarities between their discourse and optimist discourse in order to build a common ground. On this basis, it could be possible to begin to educate them about the points in which the two discourses differ, offering a new way to attempt to convince climate sceptics of the seriousness of the climate crisis. As it has been previously shown that it is inefficient to convince climate sceptics by simply showing them scientific studies, basing arguments on commonalities provides a different approach.

References

Barr, S. (2011). Climate forums: virtual discourses on climate change and the sustainable lifestyle. *Area,* 43(*1*), 14–22. doi:10.1111/j.1475-4762.2010.00958.x

Beattie, G. (2018). Optimism bias and climate change. *British Academy Review*, 33(*1).* Retrieved 11.01.2023 from https://www.thebritishacademy.ac.uk/publishing/review/33/optimism-bias-and-climate-change/

Bliuc, A., McGarty C., Thomas, E., Lala, G., Berndsen, M. & Misajon, R. (2015). Public division about climate change rooted in conflicting socio-political identities. *Nature Climate Change*, 5(*3*), 226–229. doi:10.1038/nclimate2507

Bloomfield, E. & Tillery, D. (2019). The circulation of climate change denial online: Rhetorical and networking strategies on Facebook. *Environmental Communication*, 13(*1*), 23-34. doi:10.1080/17524032.2018.1527378

Brüggemann, M., Elgesem, D., Bienzeisler, N., Dedecek-Gertz, H. & Walter, S. (2020). Mutual Group Polarization in the Blogosphere: Tracking the Hoax Discourse on Climate Change. *International Journal of Communication*, 14(*2020*), 1025–1048. Retrieved 25.1.2023 from https://ijoc.org/index.php/ijoc/article/view/11806/2975

Cattell, J. (2021) "Change is Coming": Imagined Futures, Optimism and Pessimism Among Youth Climate Protesters. *Canadian Journal of Family and Youth*, 13(*1*), 1-17. doi:10.29173/cjfy29598

Cook, J., Nuccitelli, D., Green, S. A., Richardson, M., Winkler, B., Painting, R., … Skuce, A. (2013). Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental Research Letters,* 8*(2),* 1-7. doi:10.1088/1748-9326/8/2/024024

Costello A., Maslin M., Montgomery H., Johnson A. & Ekins, P. (2011). Global health and climate change: moving from denial and catastrophic fatalism to positive action. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences,* 369(*1942*), 1866–1882. doi:10.1098/rsta.2011.0007

Etkin, D. & Ho, E. (2007). Climate Change: Perceptions and Discourses of Risk. Journal of Risk Research,10(*5*), 623–641. doi:10.1080/13669870701281462

Gable, S. & Haidt, J. (2005). What (and why) is positive psychology?. *Review of General Psychology*, 9(*2*), 103–110. doi:10.1037/1089-2680.9.2.103

Goodman, S. (2017). How to conduct a psychological discourse analysis. *Critical Approaches to Discourse Analysis across Disciplines,* 9(*2*), 142 – 153. Retrieved 11.01.2023 from https://www.lancaster.ac.uk/fass/journals/cadaad/wp-content/uploads/2017/12/09-Goodman.pdf

Harvey, J., Van Den Berg, D., Ellers, J., Kampen, R., Crowther, T., Roessingh, P., ... & Mann, M. (2018). Internet blogs, polar bears, and climate-change denial by proxy. *BioScience*, 68*(4*), 281-287. doi:10.1093/biosci/bix133

Jacques, P. & Knox, C. (2016). Hurricanes and hegemony: A qualitative analysis of micro-level climate change denial discourses. *Environmental Politics*, 25(*5*), 831-852, doi:10.1080/09644016.2016.1189233

Kurzgesagt - In A Nutshell. (2022, April 5). *We WILL fix climate change.* [Video] YouTube. https://youtu.be/LxgMdjyw8uw

Kurzgesagt (n.d.) *About.* Retrieved 13.11.2022 from https://kurzgesagt.org/about/

Mann M., Hassol S. & Toles T. (2017) Doomsday scenarios are as harmful as climate change denial. Washington Post. Retrieved 11.01.2023 from https://www.washingtonpost.com/opinions/doomsday-scenarios-are-as-harmful-as-climate-change-denial/2017/07/12/880ed002-6714-11e7-a1d7-9a32c91c6f40_story.html

Mayer, A. & Smith, E.(2018). Unstoppable climate change? The influence of fatalistic beliefs about climate change on behavioural change and willingness to pay cross-nationally. *Climate Policy*, 1–13. doi:10.1080/14693062.2018.1532872

Molek-Kozakowska, K. (2018). Popularity-driven science journalism and climate change: A critical discourse analysis of the unsaid. *Discourse, Context & Media*, 21(*1*), 73-81. doi:10.1016/j.dcm.2017.09.013

Morris, B., Chrysochou, P., Karg, S. & Mitkidis, P. (2020). Optimistic vs. pessimistic endings in climate change appeals. *Humanities and Social Science Communications* 7(*82*) doi:10.1057/s41599-020-00574-z

NYU Stern (n.d.) *Faculty Directory: Steven Koonin.* Retrieved 13.11.2022 from https://www.stern.nyu.edu/faculty/bio/steven-koonin

PragerU. (2021, October 25) *Is There Really a Climate Emergency?* [Video] YouTube. https://youtu.be/P19ywkobLX8

Potter, J. (2012). Discourse analysis and discursive psychology. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological*. American Psychological Association. pp. 119–138

Randall, R. (2009). Loss and Climate Change: The Cost of Parallel Narratives. *Ecopsychology*, 1(*3*), 118–129. doi:10.1089/eco.2009.0034

Ricke, L. D. (2014). The impact of YouTube on US politics. London, United Kingdom: Lexington Books

Seligman, M. (2002). Positive psychology, positive prevention, and positive therapy. In C.R. Snyder & S. J. Lopez (Eds.) *Handbook of Positive Psychology.* New York, New York: Oxford University Press. pp. 3–9

Toivonen, H. (2022) Themes of climate change agency: a qualitative study on how people construct agency in relation to climate change. *Humanities and Social Sciences Communications,* 9(*1*). doi:10.1057/s41599-022-01111-w

Treen, K., Williams, H. & O'Neill, S. (2020). Online misinformation about climate change. *Wiley Interdisciplinary Reviews: Climate Change,* 11(*5*), e665.

Treen, K., Williams, H., O'Neill, S. & Travis G. (2022) Discussion of Climate Change on Reddit: Polarized Discourse or Deliberative Debate?, *Environmental Communication*, 16(*5*), 680-698. doi:10.1080/17524032.2022.2050776

Tyagi, A., Uyheng, J. & Carley, K. (2020). Affective Polarization in Online Climate Change Discourse on Twitter. *2020 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*. doi:10.1109/asonam49781.2020.9381419

Uldam, J. & Askanius, T. (2013) Online Civic Cultures: Debating Climate Change Activism on YouTube. *International Journal of Communication* 7(*1*),1185–1204. Retrieved 29.1.2023 from https://ijoc.org/index.php/ijoc/article/view/1755

van Eck, C. & Feindt, P. (2021) Parallel routes from Copenhagen to Paris: climate discourse in climate sceptic and climate activist blogs. *Journal of Environmental Policy & Planning* 24(*2*). doi:10.1080/1523908X.2021.2000376

Weber, E. & Stern, P. (2011). Public understanding of climate change in the United States. *American Psychologist,* 66*(4), 315–328.* doi:10.1037/a0023253

Appendix A - Transcript "We WILL fix climate change"

Full transcript of *"We WILL fix climate change*" uploaded to YouTube by Kurzgesagt - In a Nutshell on 05.04.2022 (16 minutes and 11 seconds long)

Our home is burning. Rapid climate change is destabilising our world. It seems our emissions will not fall quickly enough to avoid runaway warming, and we may soon hit tipping points that will lead to the collapse of ecosystems and – our civilization.
While scientists, activists, and much of the younger generation urge action, it appears most politicians are committed to not doing anything meaningful, while the fossil fuel industry works actively *against* change. It seems humanity can't overcome its greed and obsession with short-term profit and personal gain to save itself.
And so, for many, the future looks grim and hopeless.
Young people feel particularly anxious and depressed.
Instead of looking ahead to a lifetime of opportunity, they wonder if they will even *have* a future, or if they should bring kids into this world. It's an age of doom and hopelessness, and giving up seems the only sensible thing to do.
But – that's not true.
You are not doomed. Humanity is not doomed.
Despite the seriousness of the situation, for years, positive trends have accumulated, and there is finally some good news and a clear path towards our collective climate goals.
Welcome to our TED talk. Please watch this video to the end. Check out our detailed sources afterwards to learn more. Okay, let's start with the scariest things.
Cancelling the apocalypse.
Some of the most widely shared stories about climate change are that it is an existential threat – the end of human civilization and maybe even our own extinction event – and that it's basically unavoidable now. But what does science actually say? As of 2022, the global average temperature has risen 1.2 degrees Celsius compared to pre-industrial times. Limiting warming to 1.5 degrees was the most ambitious goal of the Paris Agreement, but we are not likely to meet it. Already with the warming we have today, hot places will get hotter, wet places will get wetter, and the risk and strength of extreme weather events will increase significantly. Warming beyond 2 degrees makes all of these extremes more extreme, extreme weather events more common,

with more ecosystems under major pressure. Some will not survive. At 3 degrees, significant parts of earth, especially in developing countries, might become unable to feed their populations. Heatwaves will become a major global issue. Large-scale natural systems will break down. The scale and frequency of hurricanes, fires and droughts will increase and cause trillions in damage. Poor regions and subsistence farmers will be hit the hardest. Hundreds of millions of people will need to leave their homes.

In the 4 to 8 degree range, the apocalypse begins.

The hothouse earth, where things change so quickly that it may become unable to support our large human population and billions may perish, leaving the rest on a hostile alien planet.

A decade ago, for lack of action and perspective, many scientists assumed a four plus degree world was our future, and a lot of public communication focussed on exactly this future path. Luckily, it's much less likely that this version of the apocalypse will come to pass.

If current climate policies stagnate, we're likely to end up with warming of around three degrees Celsius by 2100, which is scary and tragic and far from acceptable. But this is actually good news. How? In the last decade, we've seen enough progress that most scientists now think that we have likely avoided apocalyptic climate change. Although substantial risk still remains, we can pretty confidently say that humanity isn't going anywhere.

Civilisation might have to change, but it will endure. Which begs the question: what has changed over the last ten years? And is this really good news?

The invisible shift.

You probably know this story. The last decade has been an immense failure for climate policies around the world. Instead of passing comprehensive, binding bills that would meaningfully reduce emissions, we mostly did nothing.

A lost decade with one negative record after another. And this story is true, and it's one reason why so many people are giving up. But it is not the whole picture. Despite the lack of climate policies and ongoing lobbying and misinformation campaigns from the fossil fuel industries, there was a lot of progress.

Let's go back 20 years to see why today is so different. Between 2000 and 2010, greenhouse gas emissions had grown by 24% – three times as much as the increase in the previous decade. Subsidies for fossil fuels aimed at promoting economic growth caused a colossal increase in their consumption. For developing countries like China and India, coal was the cheapest fuel for

growth, while rich countries showed little interest in changing their ways. In 2010, many people expected these trends to continue. Instead of decreasing fossil fuel use, its consumption would rise. The next decade turned out to be very different, though. First of all, coal burning in developing countries like India has slowed down or levelled off, like in China, and it's plummeted in rich countries like the UK and US.

Since 2015, three quarters of planned coal plants have been cancelled and 44 countries have committed to stop building them. Ten years ago, that would have seemed like wishful thinking. But today we can say with confidence coal is dying. It's just not competitive anymore, because technologies we thought would remain expensive matured rapidly instead. Renewable electricity has shown explosive progress. In a mere decade, wind energy got three times cheaper. Solar electricity is now ten times cheaper, cheaper than coal or any other fossil fuel burning power plant, despite the massive subsidies and global infrastructure propping up fossil fuels.

25 times more solar and nearly five times more wind electricity is produced today compared with ten years ago, which is, of course, not nearly enough.

One of the biggest obstacles is the variability of their power output.

Renewables need a lot of energy storage to be a reliable power source, like expensive batteries. Amazingly, battery prices have decreased by 97% in the past 30 years, 60% in the last decade alone, which will serve all kinds of green technology like electric cars.

You might say, well, that's great, but didn't Kurzgesagt's last climate video say that while wind and solar are nice, we need nothing less than a fundamental transition of our global industrial system?

Yes, but luckily the shift goes beyond just the energy sector. Throughout the economy, people are working on improving current technology to lower emissions. We're rapidly replacing old incandescent light bulbs with LEDs that are ten times more efficient. In 2020, about seven out of ten new cars in Norway were electric or hybrid. In 2021, it was already eight out of ten. And the list goes on: from electric heating and better insulation to ships travelling at half speed to save fuel. Wherever you look, you find scientists, engineers and entrepreneurs trying to solve some aspect of climate change.

Enormous amounts of human ingenuity are being brought to bear on this problem, with more and more people deciding to prioritise preventing rapid climate change.

Solutions for low carbon production of cement, electronics and steel and innovations like artificial meat and carbon capture are in the works. The more of these technologies we deploy, the cheaper, new and better technology gets. The cheaper they get, the more people use them and so on. We can see the impact already. The domestic CO2 output of rich countries is falling without a major recession since the year 2000. The EU as a whole shows a 21% decrease,Italy 28%, The UK 35%, Denmark 43%. But the best news may be that emissions are no longer necessarily coupled with economic growth.

In the past, this was an inconvenient truth. To get richer, you had to emit more. Which led to fierce arguments between developing and developed countries about the fairness of reducing emissions while their populations were still poor. But in the last decade, we've seen that it is possible to increase prosperity without increasing emissions. Emissions in the Czech Republic dropped 13%, while their GDP grew by 27%. France reduced their CO2 emissions by 14%, while increasing GDP by 15%. Romania saw an 8% decrease and 35% growth. And even the largest economy on Earth, the USA, decreased emissions by 4% while growing their GDP by 26%.

Some of you may call this a numbers trick that rich countries are just exporting emissions to poorer nations by moving the dirty parts of their economies, like manufacturing. But even when we account for all of our imported goods, the numbers still look positive. It's no longer a matter of having to choose between prosperity and the climate, as it seemed to be a decade ago. Developing countries will profit from that, because as rich countries pay for the expensive development of green technologies, they can adopt them more cheaply.

They can skip most of the high emission phase that today's rich countries went through. We are at the point where not decarbonising is a bad business decision and we haven't even really talked about solutions like carbon capture. In 2000, it didn't really exist. In 2022, that technology does exist and costs around $600 to remove one ton of CO2 from the atmosphere.

As investment pours in and the technology matures and begins to scale. It's likely that these costs will plummet over the next few decades.

So everything's fine then? Well, let's not get carried away. All of these processes are great, but not nearly fast enough. We're still doing way too little and technology will not magically solve everything. We need to use fewer resources and use them longer. Design consumer goods that are repairable and durable and decrease our energy requirements. We need much better

infrastructure, agriculture and cities. It will still be hard work, especially to get the right policies passed and enact it. But for the first time ever, there are a few trend lines pointing solidly in the right direction.
And now imagine, if all of this was achieved without proper financial and political support and despite fossil fuel lobbying, just think what humanity can do when climate change finally gets the political attention and funding it needs.
So is it okay to feel hopeful again? The situation is still dire and serious.
So what's the point of focusing on this side of the story?

The trap of hopelessness.
Climate change can feel overwhelming and makes your future seem bleak. The sadness and hopelessness that many people feel is real and very destructive because it causes apathy. Apathy that is only serving the fossil fuel industry, that is still delaying change however it can. In a sense, they have weaponized hopelessness.
We are now in phase four in the public debate about rapid climate change action. Phase one was "Climate change is not real". Phase two was "Climate change is real, but not caused by humans". Phase three was "Climate change may be caused by humans, but it's not that bad". The phase four is "Climate change is no longer avoidable. We are doomed. And it doesn't matter what we do". If we want the world to change, we first need to believe that change is possible and we have an abundance of evidence that it is.
Changes to our industrial system are gaining momentum. Technology gets better and cheaper. Climate change has become a key issue in most free elections. As more and more younger people move into influential positions, they prioritise climate change and work on new solutions. In 2022, most governments not only acknowledge it, but set their own net zero goals in democratic and autocratic countries. The results of years of fighting a steep uphill battle are now clearly visible. The pressure needs to keep increasing to make sure that the promises made today are actually capped. Climate tourism is the equivalent of giving up, even though you can still prevent not just the worst case, but also mitigate most of the bad things. Make changes in time to adapt better and prevent the poorest from suffering. That is why hopelessness and apathy are so dangerous. If the last in many ways wasted decade has shown anything, then it's that progress is being made and that dire scenarios are just predictions, not our sealed fate. As of 2022, based on

current global policies, we will end up in a three degrees world. Now it's our job to yet again prove the predictions wrong, despite how serious and urgent things are, to turn that three degrees into a two degrees, and then see where we can go from there.
For that we need hope. And we hope we gave you that today, at least a little, that you feel that things are serious, but also that you have a future, that you can have kids without dooming them or the world. That taking action today is worth it. And that's despite powerful industries doing everything to delay it. Society is changing. If you need a more concrete roadmap of what you can do personally, we're working on a follow up video to talk about that in greater detail.
Doomerism, inactivity and weaponized hopelessness are the only trump cards left for the powers that don't want change. Don't let them win.

Appendix B - Transcript "Is there really a climate emergency?"

Full transcript of *"Is There Really a Climate Emergency*?" uploaded to YouTube by PragerU on 25.10.2021 (5 minutes and 32 seconds long)

Hubris is a Greek word that means dangerously overconfident. Based on my research, Hubris fairly describes our current response to the issue of climate change.
Here's what many people believe: one, the planet is warming catastrophically because of certain human behaviours; two, thanks to powerful computers, we can project what the climate will be like 2040 or even a 100 years from now; and three, that if we eliminate just one behaviour, the burning of fossil fuels, we can prevent the climate from changing for as long as we like.
Each of these presumptions, together the basis of our hubris regarding the changing climate, is either untrue or so far-off the mark as to be useless.
Yes, it's true that the globe is warming and that humans are exerting a warming influence upon it, but beyond that, to paraphrase a line from the classic movie, the Princess Bride, I do not think the science says what you think it says.
For example, government reports state clearly that heat waves in the US are now no more common than they were in 1900. Hurricane activity is no different than it was a century ago.
Floods have not increased across the globe over more than 70 years.
Greenland's ice sheet isn't shrinking any more rapidly today than it was 80 years ago.
Why aren't these reassuring facts better known?

Because the public gets its climate information almost exclusively from the media - and from a media perspective, fear sells. "Things aren't that bad" doesn't sell. Very few people, and that includes journalists who report on climate news, read the actual science.

I have and what the data, the hard science, from the US government and the UN climate reports say, is that things aren't that bad. Nor does the public understand the questionable basis of all catastrophic climate change projections: Computer modelling.

Projecting future climate is excruciatingly difficult. Yes, there are human influences, but the climate is complex. Anyone who says that climate models are just physics either doesn't understand them or is being deliberately misleading. I should know. I wrote one of the first textbooks on computer modelling. While modellers based their assumptions upon both fundamental physical laws and observations of the climate, there's still considerable judgement involved, and since different modellers will make different assumptions, results vary widely among different models.

Let's just take one simple but significant assumption modellers must make: the impact of clouds on the climate. Natural fluctuations in the height and coverage of clouds have at least as much of an impact on the flows of sunlight and heat as do human influences.

But how can we possibly know global cloud coverage, say 10, let alone 50 years from now?

Obviously, we can't. But to create a climate model we have to make assumptions.

That's a pretty shaky foundation on which to transform the world's economy.

And, by the way, creating more accurate models isn't getting any easier.

In fact, the more we learn about the climate system, the more we realise how complex it is.

Rather than admit this complexity, the media, the politicians and a good portion of the climate science community attribute every terrible Storm, every flood, every major fire to Climate change. "Yes, we've always had these weather events in the past", the narrative goes, but somehow climate change is making everything worse.

Even if that were true, isn't the relevant question "How much worse"?

Not to mention that "worse" is not exactly a scientific term. And how would we make it better?

For the alarmists, that's easy. We get rid of fossil fuels.

Not only is this impractical, we get over 80% of the world's energy from fossil fuels, it's not scientifically possible. About 60% of any CO2 that we emit today will remain in the atmosphere 20 years from now, between 30% and 55%. will still be there after a century. And between 15%

and 30% will remain after a 1000 years. In other words, it takes centuries for the excess carbon dioxide to vanish from the atmosphere.

And so, any partial reduction in carbon dioxide emissions would only slow the increase in human influences, not prevent it, let alone reverse it.

CO2 is not a knob that we can just turn down to fix everything. We don't have that ability.

To think that we do is, well, Hubris. Hubris leads to bad decisions. A little humility and a little knowledge would lead to better ones.

I'm Steve Koonin, former Undersecretary for science in the Obama Administration and author of "Unsettled - What climate science tells us, what it doesn't and why it matters" for Prager University.

Thank you for watching this video. To keep PragerU videos free, please consider making a tax-deductible donation.